

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Andrew Harry on October 24, 2008.

The application has been amended as follows:

- a.) Claim 1 has been cancelled.
- b.) Claim 4 has been replaced with --An optical disc apparatus for recording information onto an optical disc, comprising: an optical head device including a laser light emitting unit configured to radiate laser light onto said optical disc, and a light detection unit illuminated by return light of the radiated laser light and configured to generate an electrical signal containing information components obtained from said optical disc based on the return light; and a signal processing circuit configured to perform control for reproducing signals recorded on said optical disc or for recording signals onto said optical disc responsive to the electrical signal output from said optical head device; said light detection unit including: a photoelectric converter unit divided into at least two portions along a direction corresponding to the radial direction of said optical disc; a multiplication circuit configured to multiply an electrical signal, generated by one of said two portions of the photoelectric converter unit, obtained by division in a direction corresponding to the radial direction of said optical disc, with a coefficient t;

and a differential circuit configured to calculate a difference between an electrical signal generated by the other of said two portions of the photoelectric converter unit obtained by division in the direction corresponding to the radial direction of said optical disc, and the electrical signal output from said multiplication circuit, to generate a radial push-pull signal, wherein said coefficient  $t$  is set to a value corresponding to a ratio of an average value of an electrical signal by return light illuminating said one of said two portions of said photoelectric converter unit and an average value of an electrical signal by return light illuminating said other of said two portions, or a ratio of said average value, sampled at a preset timing, of said electrical signal by return light illuminating said one of said two portions, and said average value, sampled at a preset timing, of said electrical signal by return light illuminating said other of said two portions, and wherein said signal processing circuit adjusts said coefficient  $t$  responsive to an error rate of a signal contained in boundary components of a recording track of said optical disc.--

c.) Claim 5 has been replaced with --An optical disc apparatus for recording information onto an optical disc, comprising: an optical head device including a laser light emitting unit configured to radiate laser light onto said optical disc, and a light detection unit illuminated by return light of the radiated laser light and configured to generate an electrical signal containing information components obtained from said optical disc based on the return light; and a signal processing circuit configured to perform control for reproducing signals recorded on said optical disc or for recording signals onto said optical disc responsive to the electrical signal output from said optical head device; said light detection unit including: a photoelectric converter unit divided

into at least two portions along a direction corresponding to the radial direction of said optical disc; a multiplication circuit configured to multiply an electrical signal, generated by one of said two portions of the photoelectric converter unit, obtained by division in a direction corresponding to the radial direction of said optical disc, with a coefficient  $t$ ; and a differential circuit configured to calculate a difference between an electrical signal generated by the other of said two portions of the photoelectric converter unit obtained by division in the direction corresponding to the radial direction of said optical disc, and the electrical signal output from said multiplication circuit, to generate a radial push-pull signal, wherein said coefficient  $t$  is set to a value corresponding to a ratio of an average value of an electrical signal by return light illuminating said one of said two portions of said photoelectric converter unit and an average value of an electrical signal by return light illuminating said other of said two portions, or a ratio of said average value, sampled at a preset timing, of said electrical signal by return light illuminating said one of said two portions, and said average value, sampled at a preset timing, of said electrical signal by return light illuminating said other of said two portions, and wherein said signal processing circuit adjusts said coefficient  $t$  responsive to an error rate of a signal contained in a wobble signal of said optical disc.--

d.) Claim 6 has been replaced with --An optical disc apparatus for recording information onto an optical disc, comprising: an optical head device including a laser light emitting unit configured to radiate laser light onto said optical disc, and a light detection unit illuminated by return light of the radiated laser light and configured to generate an electrical signal containing information components obtained from said

optical disc based on the return light; and a signal processing circuit configured to perform control for reproducing signals recorded on said optical disc or for recording signals onto said optical disc responsive to the electrical signal output from said optical head device; said light detection unit including: a photoelectric converter unit divided into at least two portions along a direction corresponding to the radial direction of said optical disc; a multiplication circuit configured to multiply an electrical signal, generated by one of said two portions of the photoelectric converter unit, obtained by division in a direction corresponding to the radial direction of said optical disc, with a coefficient  $t$ ; and a differential circuit configured to calculate a difference between an electrical signal generated by the other of said two portions of the photoelectric converter unit obtained by division in the direction corresponding to the radial direction of said optical disc, and the electrical signal output from said multiplication circuit, to generate a radial push-pull signal, wherein said coefficient  $t$  is set to a value corresponding to a ratio of an average value of an electrical signal by return light illuminating said one of said two portions of said photoelectric converter unit and an average value of an electrical signal by return light illuminating said other of said two portions, or a ratio of said average value, sampled at a preset timing, of said electrical signal by return light illuminating said one of said two portions, and said average value, sampled at a preset timing, of said electrical signal by return light illuminating said other of said two portions, and wherein said signal processing circuit adjusts said coefficient  $t$  responsive to an error rate of a signal contained in a land pre-pit signal of said optical disc.--

e.) On line 1 of claim 7, "claim 1" has been replaced with --claim 4--.

f.) At the end of claim 8, “.” has been replaced with --, and wherein said coefficient t is adjusted responsive to an error rate of a signal contained in boundary components of a recording track of said optical disc.--

g.) At the end of claim 12, “.” has been replaced with --, and wherein said coefficient t is adjusted responsive to an error rate of a signal contained in boundary components of a recording track of said optical disc.--

### ***Drawings***

2. The replacement drawings were received on July 18, 2008. These drawings are acceptable.

### ***Allowable Subject Matter***

3. Claims 4-8, 11, 12 and 14 are allowed.

In regard to claim 5, none of the references of record alone or in combination suggest or fairly teach an optical disc apparatus for recording information onto an optical disc, comprising: an optical head device including a laser light emitting unit configured to radiate laser light onto said optical disc, and a light detection unit illuminated by return light of the radiated laser light and configured to generate an electrical signal containing information components obtained from said optical disc based on the return light; and a signal processing circuit configured to perform control for reproducing signals recorded on said optical disc or for recording signals onto said optical disc responsive to the electrical signal output from said optical head device; said light detection unit including: a photoelectric converter unit divided into at least two portions along a direction corresponding to the radial direction of said optical disc; a multiplication circuit configured to multiply an electrical signal, generated by one of said two portions of the

photoelectric converter unit, obtained by division in a direction corresponding to the radial direction of said optical disc, with a coefficient  $t$ ; and a differential circuit configured to calculate a difference between an electrical signal generated by the other of said two portions of the photoelectric converter unit obtained by division in the direction corresponding to the radial direction of said optical disc, and the electrical signal output from said multiplication circuit, to generate a radial push-pull signal, **wherein said coefficient  $t$  is set to a value corresponding to a ratio of an average value of an electrical signal by return light illuminating said one of said two portions of said photoelectric converter unit and an average value of an electrical signal by return light illuminating said other of said two portions, or a ratio of said average value, sampled at a preset timing, of said electrical signal by return light illuminating said one of said two portions, and said average value, sampled at a preset timing, of said electrical signal by return light illuminating said other of said two portions, and wherein said signal processing circuit adjusts said coefficient  $t$  responsive to an error rate of a signal contained in a wobble signal of said optical disc.**

In regard to claim 6, none of the references of record alone or in combination suggest or fairly teach an optical disc apparatus for recording information onto an optical disc, comprising: an optical head device including a laser light emitting unit configured to radiate laser light onto said optical disc, and a light detection unit illuminated by return light of the radiated laser light and configured to generate an electrical signal containing information components obtained from said optical disc based on the return light; and a signal processing circuit configured to perform control for reproducing signals recorded on said optical disc or for recording signals onto said optical disc responsive to the electrical signal output from said optical head device; said light

detection unit including: a photoelectric converter unit divided into at least two portions along a direction corresponding to the radial direction of said optical disc; a multiplication circuit configured to multiply an electrical signal, generated by one of said two portions of the photoelectric converter unit, obtained by division in a direction corresponding to the radial direction of said optical disc, with a coefficient  $t$ ; and a differential circuit configured to calculate a difference between an electrical signal generated by the other of said two portions of the photoelectric converter unit obtained by division in the direction corresponding to the radial direction of said optical disc, and the electrical signal output from said multiplication circuit, to generate a radial push-pull signal, **wherein said coefficient  $t$  is set to a value corresponding to a ratio of an average value of an electrical signal by return light illuminating said one of said two portions of said photoelectric converter unit and an average value of an electrical signal by return light illuminating said other of said two portions, or a ratio of said average value, sampled at a preset timing, of said electrical signal by return light illuminating said one of said two portions, and said average value, sampled at a preset timing, of said electrical signal by return light illuminating said other of said two portions, and wherein said signal processing circuit adjusts said coefficient  $t$  responsive to an error rate of a signal contained in a land pre-pit signal of said optical disc.**

In regard to claims 4, 7, 8, 11, 12 and 14, none of the references of record alone or in combination suggest or fairly teach an optical disc apparatus, light detection unit, or optical head device comprising at least a light detection unit comprising: a photoelectric converter unit divided into at least two portions along a direction corresponding to the radial direction of said optical disc; a multiplication circuit configured to multiply an electrical signal, generated by one

of said two portions of the photoelectric converter unit, obtained by division in a direction corresponding to the radial direction of said optical disc, with a coefficient  $t$ ; and a differential circuit configured to calculate a difference between an electrical signal generated by the other of said two portions of the photoelectric converter unit obtained by division in the direction corresponding to the radial direction of said optical disc, and the electrical signal output from said multiplication circuit, to generate a radial push-pull signal, **wherein said coefficient  $t$  is set to a value corresponding to a ratio of an average value of an electrical signal by return light illuminating said one of said two portions of said photoelectric converter unit and an average value of an electrical signal by return light illuminating said other of said two portions, or a ratio of said average value, sampled at a preset timing, of said electrical signal by return light illuminating said one of said two portions, and said average value, sampled at a preset timing, of said electrical signal by return light illuminating said other of said two portions, and wherein said signal processing circuit adjusts said coefficient  $t$  responsive to an error rate of a signal contained in boundary components of a recording track of said optical disc.**

#### *Conclusion*

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fuji (US 5,563,858) (Col. 11, lines 49-54), Yamamoto et al. (US 6,078,552) (Col. 10, lines 2-7) and Inazawa et al. (US 6,157,606) (Col. 10, lines 34-39) disclose using an average value of an electrical signal to reduce the influence of noise and achieve a more accurate result.



5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V. Battaglia whose telephone number is (571) 272-7568. The examiner can normally be reached on M-F, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A. Wellington can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael V. Battaglia/  
Examiner, Art Unit 2627